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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,069	06/25/2004	Kwang-Soo Choi	1728.03	9148
29338 7590 09/29/2009 PARK LAW FIRM 3255 WILSHIRE BLVD SUITE 1110 LOS ANGELES, CA 90010				
EXAMINER				
YU, GINA C				
ART UNIT		PAPER NUMBER		
1611				
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09/29/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/500,069

Applicant(s)

CHOI ET AL.

Examiner

GINA C. YU

Art Unit

1611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on August 24, 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10, 13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 10, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 24, 2009 has been entered.

Claim Objections

Claim 9 is objected to because of the following informalities: claim 9, line 14, after the term "nanoparticles", the period should be replaced with a comma.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9, 10, 13, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "generally" in claim 9 is a relative term which renders the claim indefinite. The term "generally" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. In this case, the

term renders the claim vague and indefinite because it is not clear whether all of the crystal structure of the titanium dioxide should be anatase-type, or a certain amount of the crystal can be in some other form. The metes and bounds of the scope of the claim limitation are uncertain.

Also in claim 9, line 17, the term "aqueous solution" renders the claim vague and indefinite because the claim does not positively describe how the "aqueous solution" relates to the liquid composition of the claim. It is not clear whether claim 9 necessarily requires the claimed composition to comprise an aqueous solution. Examiner suggests positively stating the limitation "wherein the composition comprises an aqueous solution of a stable colloidal", etc.

Also in claim 9, the term "for absorbing to plant" renders the claim vague and indefinite. It is not clear what applicant means by such term.

The remaining claims are rejected as they depend on the indefinite base claim.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 9, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (US 6589912 B2) in view of Batarseh (US 6630172 B2).

In claim 9, the recitation "for greater effect on crop yield, when applied to the foliage of crops" denotes the intended future use of the claimed composition. The recitation here is a preamble, which is not given patentable weight. See MPEP § 2111. 02.

For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See MPEP § 2111.03.

Kawai teaches compositions for regulating plant growth and controlling disease, wherein the compositions comprise at least one semiconductor photocatalyst, preferably titanium dioxide, suspended in water. See instant claim 9. The reference teaches the composition is sprayed on the foliage of a plant so that the photodecomposition of water on the surface of the foliage is advanced, accelerating the photosynthesis and expediting the generation of plant hormones and Phyto-0alexin which provides a disease resistance for the plant, while decomposing excess bactericide or insecticide on the foliage. See col. 2, line 41 – col. 3, line 47. The reference teaches spraying the prior art composition on the foliage results in the plant growth, improved rooting, and advanced maturity dates. See *Id.*

The reference teaches anatase-type titanium dioxide has a photodecomposition efficiency higher than other crystal types, and suggests using such titanium dioxide of average particle size 5-100 nm. See col.8, line 58 - col. 9, line13; instant claim 9. The reference also teaches the most preferred concentration of the photocatalyst ranges from 0.0005 % to 1 % by weight of the composition. See col. 7, lines 54 – 65; instant claim 9. Other semiconductor photocatalysts useful for the invention include ZnO, ZnS, SnO₂, KTaO₃, etc., meeting instant claims 10 and 14. Adding suspending anionic and/or nonionic agents and organic and/or inorganic acids to neutralize the

compositions is taught in col. 11, lines 3-12. Kawai further teaches dope metals such as silver on the surface of titanium oxide for the purpose of promoting the photocatalytic effect. (emphasis mine) See col. 8, lines 50 – 57.

Kawai does not specifically mention using the particle size and the amount of silver.

Batarsch reports that colloidal silver is a pure, all-natural substance consisting of sub-microscopic clusters of silver ions held in aqueous suspension having a powerful prophylactic antibiotic which was used for years with no known side effects. See col. 2, lines 19 -31. The Batarsch patent is directed to microbicidal composition for various applications including disinfecting plants, which utilizes colloidal silver in an aqueous medium in the form of silver complexed with potassium sodium tartrate in an acidic pH. See col. 3, lines 13 – 62. The reference illustrates an example of the prior art comprising 25 ppm or less of the silver complex. See example 1.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to modify the teachings of Kawai by combining with titanium dioxide of the composition with silver nanoparticles in the amount as motivated by Batarsch, because 1) Kawai teaches to dope the semiconductor photocatalyst with silver to increase the resulting photocatalytic effect; and 2) Batarsch teaches colloidal silver of nano-scale has been used as antibiotic and uses the same to make microbicidal compositions for plants.

Examiner also views that the effective amount of silver nanoparticles in this case would have been well within the skill of the art given the teachings of the references. Generally, differences in concentration will not support the patentability of subject matter

encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." See In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In this case, Kawai teaches the particle size and the amount of titanium dioxide used in the present invention and the expected resulting effect of doping the metal oxide with silver, which is to obtain enhanced photocatalytic effect. Similarly, with the amount of the other semiconductor photocatalyst metals used in the composition in instant claims 10 and 14, the skilled artisan would have been able to discover the optimal weight amount of the metal(s) by routine experimentations because Kawai teaches the range of the amounts of the photocatalysts useful for the invention that may be used in the compositions.

By combining the teachings of Kawai and Batarseh, the skilled artisan would have had a reasonable expectation of successfully producing an aqueous dispersion comprising titanium dioxide nanoparticles and colloidal silver, and made an enhanced plant growth promoter that is also useful as a disease controlling and disinfecting composition for plants, as the applicant has done in this case.

Response to Arguments

Applicant's arguments with respect to claims 9, 10, 13, and 14 have been considered but are unpersuasive.

Applicant asserts Aubay fails to teach the applicant's limitation on the titanium dioxide concentration of the presently claimed composition. The argument is

unpersuasive because lower limitation of the prior art, 100 ppm of titanium dioxide overlaps with the applicant's upper limitation. See MPEP § 2144.05.

Applicant asserts the present invention overcomes the disadvantages of using silver nanoparticles for agricultural uses, namely, the cost and difficulty for application to crops, by combining titanium dioxide and silver nanoparticles in the presently claimed weight ratio to induce "excellent bactericidal activity". However, applicant already has admitted in specification p. 14, line 13-21 that such improvement is due to the additive effects of the two bactericidal agents, which is an obvious result.

Applicant lastly asserts the titanium dioxide of the present invention is of anatase type. As indicated in the rejection above, Aubay also teaches using such crystalline type of titanium dioxide.

For the above reasons, applicant's arguments are viewed unpersuasive.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GINA C. YU whose telephone number is (571)272-8605. The examiner can normally be reached on Monday through Thursday, from 8:00AM until 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sharmila Landau can be reached on 571-272-0614. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GINA C. YU/
Primary Examiner, Art Unit 1611